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ABSTRACT

This study tested the effectiveness of a typing tutorial in teaching keyboarding skills to middle- and upper-grade elementary school students in both supervised and unsupervised environments. Subjects were 56 students enrolled in grades three through six, who were divided into two groups, supervised and unsupervised, and subdivided by grade (third and fourth together, and fifth and sixth together). Students were pretested for typing proficiency, and then completed lessons from the tutorial, "Microtype: The Wonderful World of Paws." In the supervised condition, research assistants monitored students for proper keystroking technique, while in the unsupervised condition, research assistants answered questions but offered no suggestions about proper keystroking techniques. After the completion of 14 lessons, a posttest was administered. Students were found to have made similar progress in the development of their keyboarding skills regardless of environment, supervised or unsupervised, grade level, gender, or prior experience with typing. An increase in words typed per minute occurred in all four grade levels, and in all environments, except for the sixth grade students in the supervised environment. Analysis also indicated that there was no difference between students in the supervised and unsupervised environments in terms of whether they placed their hands on the home keys, or where they focused their visual attention during the keyboarding sessions. Data analyses are displayed in four tables. (13 references) (EW)

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Teaching Keyboarding Skills to Elementary School Students in Supervised and Unsupervised Environments

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"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
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Research has shown that it is possible to teach young children how to type, but only since the introduction of microcomputers in the elementary school has attention focused on the need for keyboarding instruction. Advocates of keyboarding instruction claim that children as young as eight and nine years old have the necessary fine motor skills, eye-hand coordination and alphabet recognition to develop this skill (Erthal, 1985). A student who has good keyboarding skills is able to concentrate on problem solving or composing with the computer, rather than on the mechanics of typing. Wetzel (1985) discovered that most fourth, fifth, and sixth grade students can hand copy seven to ten words per minute. He suggested that students should at least be able to type as fast as they write.

The most effective way for students to learn keyboarding is through organized instruction (Kisner, 1984). Otherwise, students will develop their own "hunt and peck" methods of typing (Headley, 1983). Students will waste time finding the right keys and will develop poor typing habits which will be very difficult to correct later (Dickey-Olson, 1982; Kisner, 1984; Robinson, 1985; Sormunen, 1984; Wetzel, 1985). Business educators support keyboarding instruction before or in conjunction with the microcomputer experience (Rauch & Yanke, 1982).

Computer software can provide keyboarding instruction (Bartholome & Long, 1986; Elser, 1987; Wetzel, 1985). These

typing tutorials with correct modeling techniques provide practice in keyboarding through a series of developmental lessons. As the term tutorial implies, the software is intended to be used independently by the students for skill development with a minimum of teacher intervention.

The purpose of this study was to determine the effectiveness of a typing tutorial in teaching keyboarding skills to middle- and upper-grade elementary school students in both supervised and unsupervised environments. Given the apparent need for young students to function more efficiently when keyboarding while using software for text writing, it is important to know if a typing tutorial enables students to build these skills without the teacher providing direct instruction. Hoot (1986) indicated that keyboarding skill can be developed without teacher assistance during non-instructional periods.

It was hypothesized that students who used a typing tutorial in a supervised environment to learn keyboarding/touch typing would be able to type with greater speed and accuracy than those students who used a typing tutorial in an unsupervised environment to learn keyboarding/touch typing. Related questions included: 1. Is a typing tutorial effective in teaching keyboarding skills to students in grades three through six?; 2. Does prior typing instruction have an effect on keyboarding speed and accuracy? and, 3. Is proper keyboarding technique, as

demonstrated on the posttest, related to keyboarding speed and accuracy?

DESIGN OF THE STUDY

Subjects

A stratified (by grade level) random sample of 56 students enrolled in grades three through six in the laboratory school at Indiana University of Pennsylvania participated in the study. There were 28 students randomly assigned to the supervised condition and 28 students randomly assigned to the unsupervised condition. There were 28 males and 28 females. Students who were physically handicapped were excluded from the study.

Students in grades three through six were chosen for the study because they are capable of learning keyboarding skills (Warwood, Hartman, Hauwiller, & Taylor, 1985).

Procedure

Prior to beginning the study, students who had been assigned to the supervised condition and unsupervised condition were subgrouped by grade level to produce small groups for the treatment. Third and fourth grade students were combined and fifth and sixth grade students were combined. This yielded four groups, two groups in the supervised condition and two groups in the unsupervised condition.

Before the treatment, each pupil was tested to ascertain his/her typing proficiency. The pretest consisted of each pupil being asked to keyboard one piece of text for one minute. The text was a sample from the Durrell Analysis of Reading Difficulty, Level 2 (Durrell, 1955). The pretest took place in a computer laboratory setting with three research assistants working from a prepared script. The script included information about the importance of learning to keyboard or touch type, the need for the pretest in a special program to help them learn to keyboard, and the need for a posttest after the student completed the lessons. Emphasis was placed on the fact that no one passes or fails the pretest or posttest. Students were directed to type as much as they could for one minute from the selection and not focus on correcting errors.

Both the supervised and unsupervised groups met for a twenty-five minute period each day for four consecutive days during the week. The time of day for working on the typing tutorial was counterbalanced for the groups. During each period, each child completed one lesson from the typing tutorial, Microtype, The Wonderful World of Paws, published by Southwestern Publishing Company, Cincinnati, Ohio. If students completed the lesson before the period was over, they were directed to repeat parts of the lesson which they chose. The fifth day was used for make up lessons for students who had been absent. The students in both groups

completed fourteen lessons in the typing tutorial in four weeks. The fourteen lessons consisted of learning to touch type all letters of the alphabet, all numbers, and some special computer keys. The research assistants did not provide reinforcement for on- or off-task behavior in either condition. At the conclusion of each session, a research assistant recorded observations about specific student behavior.

In the supervised condition, the research assistants circulated continously during the twenty-five minute period monitoring students for proper keystroking technique. Proper keystroking technique was defined as having fingers curved over the home keys, reaching to other keys with the correct fingers, having wrists low, just above the keyboard, and focusing eyes on the monitor and not the keyboard.

In the unsupervised condition, the research assistants sat off to the side of the computer lab. They answered any questions that students asked but offered no suggestions about proper keystroking techniques.

When fourteen lessons had been completed, the research assistants administered the keystroking posttest, an additional paragraph from the Durrell Analysis of Reading Difficulty - Level 2 (Durrell, 1955). Observations about proper keystroking technique, as defined earlier, were noted for each individual.

In calculating the number of words that had been typed in one minute on the keystroking pretest and posttest only correctly spelled words were counted. In addition, the following typing errors were subtracted from the number of correctly typed words: error in spacing; missing or incorrect punctuation; errors in capitalization; and, omitted words.

Results

Table 1 presents data for the 56 pupils and reports the number of words typed by the pupils in the supervised and unsupervised environments by grade level for both the pretest and the posttest. Examination of this table allows one to observe that there was a gain in the number of words keyboarded by seven of the eight groups. Also, there was a general increase in the performance of the pupils as they progressed from grade 3 to grade 6, regardless of treatment. At the time of the posttest, third grade students typed 8.0 words per minute (wpm), fourth graders 10.0 wpm, fifth graders 11.0 wpm and sixth graders 13.95 wpm.

Table 1 about here

To determine if there were any significant differences among the predictor variables, an analysis of covariance

(ANCOVA) with the pretest as the covariate was utilized. In this 2x4x2x2 ANCOVA, Table 2, using the posttest score as the dependent measure, the main effect of group membership, supervised or unsupervised, grade enrolled, 3-6, and gender, male or female, and prior experience with touch typing training did not have a significant impact on the dependent measure when the pretest was used as the covariate. A similar finding occurred in the analysis of the two way interactions.

Table 2 about here

To determine if there was a relationship between environment and a pupils' behavior during the typing, two analyses were completed. The first analysis focused its attention on the placement of a pupils' hands while they were performing the posttest. This analysis indicated that there was no difference between the groups and whether they placed their hands on the home keys. (x^2=.00, p>.99)

Table 3 about here

An additional analysis focused its attention on where the pupil focused his/her visual attention as he/she

performed the posttest. Again, there was no difference between the groups on where they focused their visual attention on the keyboard, text or monitor. ($x^2 = 2.38$, $p>.12$).

Table 4 about here

Discussion

Students made similar progress in the development of their keyboarding skills regardless of environment, supervised or unsupervised, grade level in which they were enrolled, gender or prior experience with typing. An increase in words typed per minute occurred at all grade levels, third grade through sixth grade, and in both environments except for the sixth grade students in the supervised environment. These students experienced a slight decline in words per minute. However, they had already achieved a mean of more than 15 words per minute prior to using the typing tutorial.

Students in both the supervised and unsupervised environments at all grade levels exceeded seven words per minute on the keyboarding posttest. This is in line with Wetzel's (1985) recommendation that students in the intermediate grades should be able to type as many words as they can hand copy. He found that fourth, fifth, and sixth

grade students can hand copy seven to ten words per minute. The fourth grade students in the supervised environment and all the fifth and sixth grade students typed more than ten words per minute on the posttest.

Students did not reach the number of words per minute suggested by Kisner (1984) who advocated a goal of 20 words per minute for students in kindergarten through third grade and 25 words per minute for students in grades four through six. It's possible that the words typed per minute would increase as students had more keyboarding practice. Additional research would be needed to determine if further practice would increase typing speed and accuracy.

Analysis indicated that there was no difference between students in the supervised and unsupervised environments in terms of whether they place their hands on the home keys. There was, also, no difference between groups on where they focused their visual attention during the keyboarding sessions, on the keyboard, text, or monitor. It was evident that there needs to be greater emphasis on proper keyboarding techniques, if one believes that students should exhibit proper hand and eye position. Use of the typing tutorial does not insure proper keystroking technique which was defined as having fingers curved over the home keys, reaching to other keys with the correct fingers, having wrists low, just above the keyboard, and focusing eyes on the monitor and not the keybaord. (Proper

keystroking technique has been emphasized during traditional instruction in learning to type.)

This study indicates that a typing tutorial can be used to increase keyboarding speed and accuracy in either a supervised or unsupervised environment. However, there needs to be greater emphasis on proper keyboarding techniques, if students are expected to keystroke properly. Additional research needs to be conducted to determine the effects of practice of keyboarding skills for a period longer than four weeks or 14 sessions. In addition, research is needed to determine the impact of using keyboarding skills on the quality of writing.

Table 1: Mean Numbers of Words Keyboarded by Pupils in Different Environments

	Grade 3			Grade 4			Grade 5			Grade 6		
	n	pre test	post test	n	pre test	post test	n	pre test	post test	n	pre test	post test
Supervised	9	4.88	7.44	4	7.50	13.25	8	8.12	10.50	7	15.43	14.86
UnSupervised	9	7.11	9.44	4	7.50	8.00	8	9.75	11.87	7	9.71	13.00

Table 2: Analysis of Covariance of Keyboarding Posttest Scores by Environment, Grade, Gender and Prior Typing Experience.

Source	df	ms	F
Environment A	1	.019	.001
Grade B	3	1.881	.101
Gender C	1	5.801	.344
Typing Experience D	1	3.043	.180
A X B	3	18.380	1.090
A X C	1	26.455	1.560
A X D	1	.600	.030
B X C	3	1.709	.100
B X D	3	1.091	.060
C X D	1	4.656	.270
Within Error	36	16.869	
Total	55	28.083	

Table 3: Position of Pupils' Hands During Testing Session

Group	Hand position	
	on homekeys	off homekeys
Supervised	16	12
Unsupervised	15	13

x^2 (df = 1, n = 56) = .00; p > .99

Table 4: Pupils' visual attention during testing session

Group	Direction of visual attention	
	Keyboard/Text	Monitor
Supervised	10	18
Unsupervised	4	24

x^2 (df = 1, n = 56) = 2.38; p > .12

References

Bartholome, L. W., & Long, I. D. (1986). Teach keyboarding to elementary school students. National Association of Laboratory Schools Journal, X(2), 22-27.

Dickey-Olson, P. A. (1982). Remember when business educators taught business classes? Journal of Business Education, 58, 11-12.

Durrell, D. P. (1955). Durrell analysis of reading difficulty. (New ed.). New York: Harcourt Brace Jovanovich.

Elser, L. (1987). No more hunt-and-peck! Classroom Computer Learning, 7(7), 52-56.

Erthal, M. J. (1985). The status of keyboarding. Journal of Business Education, 60(5), 192-193.

Headley, P. L. (1983). Keyboarding instruction in elementary school. Business Education Forum, 38(3), 18-19.

Hoot, J. L. (1986). Keyboarding instruction in the early grades - must or mistake? Childhood Education, 63(2), 95-101.

Kisner, E. (1984). Keyboarding - must in tomorrow's world. The Computing Teacher, 11(6), 21-22.

Rauch, V. C. & Yanke, P. B. (1982). Keyboarding in kindergarten - is it elementary? Busines Education Forum, 37(3), 19-20.

Robinson, J. (1985). Elementary keyboarding: Some factors to consider. (Reprinted from Century 21 Reporter, South-Western Publishing Co., Cincinnati, OH.)

Sorumen, C. (1984). Inservice workshops: One answer to the issue of elementary school keyboarding. Journal of Business Education, 60(1), 14-17.

Warwood, B., Hartmen, V., Hauwiller, J., & Taylor, S. (1985). A research study to determine the effects of early keyboard use upon student development in occupational keyboarding. Bozeman, MT: Montana State University. (ERIC Document Reproduction Service No. ED 265 367)

Wetzel, K. (1985). Keyboarding skills: Elementary, my dear? (1986). Eugene, OR: The International Council for Computer in Education.